

CLAIMS

What is claimed is:

1. A wheel support bearing assembly comprising:
 - an outer member;
 - an inner member positioned inside the outer member to define an annular space therebetween;
 - at least one row of rolling element accommodated within the annular space and operatively interposed between the inner and outer members;
 - a sealing device for sealing an open end of the annular space; and
 - a protective cover made of a non-magnetic material;wherein said sealing device comprises
 - first and second annular sealing plates fitted to different members out of the inner and outer members, each of the first and second sealing plate including a generally cylindrical wall and a radial wall assembled together to represent a generally L-shaped section, the first and second sealing plates being positioned within the annular space in face-to-face relation with each other, the first sealing plate being fitted to a rotating member out of the inner and outer members with the radial wall of the first sealing plate positioned on one side adjacent an exterior of the bearing assembly;
 - an annular multi-pole magnet having a plurality of different magnetic poles alternating in a direction circumferentially thereof and fitted to the radial wall of the first sealing plate; and
 - the second sealing plate including a side sealing lip, slidably engaged with the radial wall of the first sealing plate and oppositely extending radial sealing lips slidably engaged with the cylindrical wall of the first sealing plate, the cylindrical wall of the second sealing plate being positioned adjacent a slight distance from a free edge of the radial wall of the first sealing plate with a slight radial gap defined therebetween;and

wherein the protective cover is disposed exteriorly of the multi-pole magnet and positioned adjacent thereto with a predetermined air gap defined therebetween so that a number of revolution can be detected through the protective cover.

2. The wheel support bearing assembly as claimed in claim 1, wherein the protective cover is fitted to one of the first and second members that serves as a stationary member.

3. The wheel support bearing assembly as claimed in claim 1, wherein the inner member is a rotating member.

4. The wheel support bearing assembly as claimed in claim 1, wherein a slight labyrinth gap is defined between the protective cover and one of the first and second members that serves as a rotating member.

5. The wheel support bearing assembly as claimed in claim 1, further comprising a sealing lip integrated with a radial edge of the protective cover and held in sliding contact with an end face of one of the inner and outer members that serves as a rotating member.

6. The wheel support bearing assembly as claimed in claim 1, wherein the protective cover is fitted to an outer periphery of the outer member.

7. The wheel support bearing assembly as claimed in claim 1, wherein the protective cover has a mounting portion, and further comprising a sealing rubber integrated with the mounting portion of the protective cover.

8. A wheel support bearing assembly comprising:
an outer member;

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an inner member positioned inside the outer member to define an annular space therebetween;

at least one row of rolling element accommodated within the annular space and operatively interposed between the inner and outer members;

a sealing device for sealing an open end of the annular space, and

a protective cover made of a non-magnetic material;

wherein said sealing device comprises

first and second annular sealing plates fitted to different members out of the inner and outer members, each of the first and second sealing plate including a generally cylindrical wall and a radial wall assembled together to represent a generally L-shaped section, the first and second sealing plates being positioned within the annular space in face-to-face relation with each other, the first sealing plate being fitted to a rotating member out of the inner and outer members with the radial wall of the first sealing plate positioned on one side adjacent an exterior of the bearing assembly;

an annular multi-pole magnet having a plurality of different magnetic poles alternating in a direction circumferentially thereof and fitted to the radial wall of the first sealing plate; and

the second sealing plate including a side sealing lip, slidingly engaged with the radial wall of the first sealing plate and oppositely extending radial sealing lips slidingly engaged with the cylindrical wall of the first sealing plate, the cylindrical wall of the second sealing plate being positioned adjacent a slight distance from a free edge of the radial wall of the first sealing plate with a slight radial gap defined therebetween;

wherein a portion outside the multi-pole magnet is covered by the protective cover; and

wherein the protective cover is of a generally L-sectioned shape including an upright wall, covering the multi-pole magnet, and a cylindrical wall fitted to one of the inner and outer members to serve as a rotating member, said first sealing plate being fitted to the cylindrical wall of the protective cover.

9. A wheel support bearing assembly comprising:

- an outer member;
- an inner member positioned inside the outer member to define an annular space therebetween;
- at least one row of rolling element accommodated within the annular space and operatively interposed between the inner and outer members;
- a sealing device for sealing an open end of the annular space, and
- a protective cover made of a non-magnetic material;

wherein said sealing device comprises

- first and second annular sealing plates fitted to different members out of the inner and outer members, each of the first and second sealing plate including a generally cylindrical wall and a radial wall assembled together to represent a generally L-shaped section, the first and second sealing plates being positioned within the annular space in face-to-face relation with each other, the first sealing plate being fitted to a rotating member out of the inner and outer members with the radial wall of the first sealing plate positioned on one side adjacent an exterior of the bearing assembly;
- an annular multi-pole magnet having a plurality of different magnetic poles alternating in a direction circumferentially thereof and fitted to the radial wall of the first sealing plate; and
- the second sealing plate including a side sealing lip, slidably engaged with the radial wall of the first sealing plate and oppositely extending radial sealing lips slidably engaged with the cylindrical wall of the first sealing plate, the cylindrical wall of the second sealing plate being positioned adjacent a slight distance from a free edge of the radial wall of the first sealing plate with a slight radial gap defined therebetween;
- wherein a portion outside the multi-pole magnet is covered by the protective cover; and
- wherein an elastic sealing member is interposed between the protective cover and one of the inner and outer members to serve as a rotating member.

10. A wheel support bearing assembly comprising:

- an outer member;
- an inner member positioned inside the outer member to define an annular space therebetween;
- at least one row of rolling element accommodated within the annular space; and operatively interposed between the inner and outer members;
- a sealing device for sealing an open end of the annular space; and
- a protective cover made of a non-magnetic material;

wherein said sealing device comprises

- first and second annular sealing plates fitted to different members out of the inner and outer members, each of the first and second sealing plate including a generally cylindrical wall and a radial wall assembled together to represent a generally L-shaped section, the first and second sealing plates being positioned within the annular space in face-to-face relation with each other, the first sealing plate being fitted to a rotating member out of the inner and outer members with the radial wall of the first sealing plate positioned on one side adjacent an exterior of the bearing assembly;
- an annular multi-pole magnet having a plurality of different magnetic poles alternating in a direction circumferentially thereof and fitted to the radial wall of the first sealing plate; and
- the second sealing plate including a side sealing lip, slidably engaged with the radial wall of the first sealing plate and oppositely extending radial sealing lips slidably engaged with the cylindrical wall of the first sealing plate, the cylindrical wall of the second sealing plate being positioned adjacent a slight distance from a free edge of the radial wall of the first sealing plate with a slight radial gap defined therebetween;

wherein a portion outside the multi-pole magnet is covered by the protective cover; and

- wherein the protective cover has an outer peripheral edge engaged with an outer peripheral edge of the upright wall of the first sealing plate.

11. A wheel support bearing assembly comprising:

- an outer member;
- an inner member positioned inside the outer member to define an annular space therebetween;
- at least one row of rolling element accommodated within the annular space; and operatively interposed between the inner and outer members;
- a sealing device for sealing an open end of the annular space; and
- a protective cover made of a non-magnetic material;

wherein said sealing device comprises

- first and second annular sealing plates fitted to different members out of the inner and outer members, each of the first and second sealing plate including a generally cylindrical wall and a radial wall assembled together to represent a generally L-shaped section, the first and second sealing plates being positioned within the annular space in face-to-face relation with each other, the first sealing plate being fitted to a rotating member out of the inner and outer members with the radial wall of the first sealing plate positioned on one side adjacent an exterior of the bearing assembly;
- an annular multi-pole magnet having a plurality of different magnetic poles alternating in a direction circumferentially thereof and fitted to the radial wall of the first sealing plate; and
- the second sealing plate including a side sealing lip, slidingly engaged with the radial wall of the first sealing plate and oppositely extending radial sealing lips slidingly engaged with the cylindrical wall of the first sealing plate, the cylindrical wall of the second sealing plate being positioned adjacent a slight distance from a free edge of the radial wall of the first sealing plate with a slight radial gap defined therebetween;
- wherein a portion outside the multi-pole magnet is covered by the protective cover; and
- wherein the multi-pole magnet has its opposite surfaces bonded respectively to the protective cover and the upright wall of the first sealing plate while being sandwiched between the protective cover and the upright wall of the first sealing plate.

12. A wheel support bearing assembly comprising:

- an outer member;
- an inner member positioned inside the outer member to define an annular space therebetween;
- at least one row of rolling element accommodated within the annular space and operatively interposed between the inner and outer members;
- a sealing device for sealing an open end of the annular space;
- a protective cover of a generally L-shaped section having an upright wall and a generally cylindrical wall both defined therein; and
- an annular multi-pole magnet having a plurality of different magnetic poles alternating in a direction circumferentially thereof and fitted to the radial wall of the first sealing plate, said multi-pole magnet being secured to an inner face of the upright wall of the protective cover;

wherein said sealing device comprises

- first and second annular sealing plates fitted to different members out of the inner and outer members, each of the first and second sealing plate including a generally cylindrical wall and a radial wall assembled together to represent a generally L-shaped section, the first and second sealing plates being positioned within the annular space in face-to-face relation with each other, the first sealing plate being fitted to a rotating member out of the inner and outer members with the radial wall of the first sealing plate positioned on one side adjacent an exterior of the bearing assembly; and
- the second sealing plate including a side sealing lip, slidably engaged with the radial wall of the first sealing plate and oppositely extending radial sealing lips slidably engaged with the cylindrical wall of the first sealing plate, the cylindrical wall of the second sealing plate being positioned adjacent a slight distance from a free edge of the radial wall of the first sealing plate with a slight radial gap defined therebetween;

wherein the protective cover is positioned so as to confront the upright wall of the first sealing plate and said cylindrical wall of the protective cover is mounted on one of the first and second members that serves as a rotating member; and

wherein the cylindrical wall of the first sealing plate is mounted on the cylindrical wall of the protective cover.